

STABILIZATION OF OXIDATION-SENSITIVE OR UV-SENSITIVE ACTIVE INGREDIENTS

5 **Cross-Reference to Related Applications**

This is a continuation application of PCT/EP02/09374, filed August 22, 2002, which is incorporated herein by reference in its entirety, and also claims the benefit of German Priority Application No. 101 41 472.2, filed August 29, 2001.

10 **Field of the Invention**

The present invention relates to the use of alkyl naphthalates for improving the effectiveness of hydrophilic active ingredients in cosmetic or dermatological preparations. The present invention preferably relates to the use of alkyl naphthalates for improving the effectiveness of water-soluble skincare substances – such as, for 15 example, biotin, carnitine, flavonoids, such as alpha-glucosylrutin, ascorbic acid and the like – and to cosmetic or dermatological preparations in which such active ingredients can be stored in stable form over a long period and which represent a good transport means for these active ingredients.

20 **Background of the Invention**

Cosmetic skincare serves primarily to strengthen or restore the natural function of the skin as a barrier against environmental influences (e.g. dirt, chemicals, microorganisms) and against the loss of substances intrinsic to the body (as well as water, also natural fats, electrolytes, etc.).

25 Impairment of this function may lead to increased resorption of toxic or allergenic substances or to attack by microorganisms, resulting in toxic or allergic skin reactions.

30 A further aim of skincare is to compensate for the loss by the skin of sebum and water caused by daily washing. This is particularly important when the natural

regeneration ability is inadequate. Furthermore, skincare products should protect against environmental influences, in particular against sun and wind, and delay skin ageing.

5 Chronological skin ageing is caused, for example, by endogenous, genetically determined factors. As a result of ageing, the following structural damage and functional disorders, which can also fall under the term "senile xerosis", arise in the epidermis and dermis:

- 10 a) dryness, roughness and formation of dryness wrinkles,
- b) itching and
- c) reduced refatting by sebaceous glands (e.g. after washing).

Exogenous factors, such as UV light and chemical noxae, can have a cumulative effect and, for example, accelerate or supplement the endogenous ageing processes.

15 In the epidermis and dermis, for example, the following structural damage and functional disorders may arise in the skin in particular as a result of exogenous factors; these are more far-reaching than the degree and quality of the damage in the case of chronological ageing:

- 20 d) visible vascular dilations (teleangiectases, couperosis);
- e) flaccidity and formation of wrinkles;
- f) local hyperpigmentation, hypopigmentation and abnormal pigmentation (e.g. age spots) and
- g) increased susceptibility to mechanical stress (e.g. cracking).

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Summary of the Invention

The present invention relates in particular to products for the care of skin aged in a natural way, and for the treatment of the consequential damage of photoageing in

particular of the phenomena listed under a) to g), preferably those which are characterized by increased effectiveness.

In particular, the present invention relates to cosmetic preparations with effective protection against harmful oxidation processes in the skin, but also for the protection of cosmetic preparations themselves or for the protection of the constituents of cosmetic preparations against harmful oxidation processes.

The present invention further relates to antioxidants, preferably those which are used in skincare cosmetic or dermatological preparations. In particular, the invention also relates to cosmetic and dermatological preparations comprising such antioxidants. In a preferred embodiment, the present invention relates to cosmetic and dermatological preparations for the prophylaxis and treatment of cosmetic or dermatological changes in the skin, such as e.g. skin ageing, in particular skin ageing caused by oxidative processes.

In addition, the present invention relates to active ingredients and preparations comprising such active ingredients for the cosmetic and dermatological treatment or prophylaxis of erythematous, inflammatory, allergic or autoimmunoreactive phenomena, in particular dermatoses.

In a further advantageous embodiment, the present invention relates to active ingredient combinations and preparations which serve for the prophylaxis and treatment of photosensitive skin, in particular of photodermatoses.

The harmful effect of the ultraviolet part of solar radiation on the skin is generally known. The rays have different effects on the skin organ depending on their particular wavelength: so-called UV-C radiation with a wavelength below 290 nm is absorbed by the ozone layer in the earth's atmosphere and therefore is of no physiological

importance. By contrast, rays in the range between 290 nm and 320 nm, the so-called UV-B region, cause erythema, simple sunburn or even burns of greater or lesser severity. A maximum for the erythema activity of sunlight is stated as being the relatively narrow range around 308 nm.

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Numerous compounds are known for protecting against UV-B radiation, examples thereof being derivatives of 3-benzylidene camphor, of 4-aminobenzoic acid, of cinnamic acid, of salicylic acid, of benzophenone, and of triazine.

10 It has long been incorrectly assumed that the long-wave UV-A radiation with a wavelength between 320 nm and 400 nm has only a negligible biological effect. However, it has now been proven by numerous studies that UV-A radiation is far more hazardous than UV-B radiation with regard to the triggering of photodynamic, specifically phototoxic, reactions and chronic changes in the skin. The harmful effect of
15 UV-B radiation can also be further intensified by UV-A radiation.

20 Thus, it has been proven, inter alia, that even UV-A radiation under entirely normal everyday conditions is sufficient to damage within a short time the collagen and elastin fibers which are of essential importance for the structure and firmness of the skin. This results in chronic photoinduced changes in the skin – the skin "ages" prematurely. The clinical appearance of skin aged by light includes, for example, wrinkles and lines and an irregular, furrowed relief. In addition, the areas affected by photoinduced skin aging may have irregular pigmentation. The formation of brown spots, keratoses and even carcinomas or malignant melanomas is also possible. Skin
25 aged prematurely by everyday exposure to UV is additionally characterized by a lower activity of the Langerhans cells and a slight chronic inflammation.

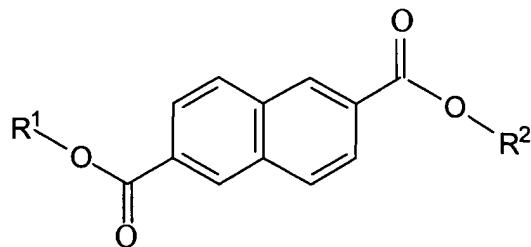
It is therefore of fundamental importance that cosmetic and dermatological photoprotective preparations offer adequate protection both against UV-B and also against UV-A radiation.

5 The prior art also recognizes a series of different efficient, hydrophilic skincare active ingredients – such as, for example, biotin, carnitine, flavonoids, such as alpha-glucosylrutin, ascorbic acid and the like – whose use in cosmetic and dermatological formulations, in particular in formulations of the oil-in-water type, is very desirable. Sadly, however, such substances are often very unstable meaning that, particularly in
10 aqueous media, they rapidly decompose and in so doing lose their effectiveness. Moreover, since they are poorly soluble in oil, an effective concentration of hydrophilic active ingredients can only be achieved with difficulty even in nonaqueous systems.

A further object of the present invention was therefore, in particular, to overcome
15 the disadvantages of the prior art and to protect hydrophilic skincare active ingredients, in particular biotin, carnitine, flavonoids, such as alpha-glucosylrutin, and ascorbic acid, from decomposition and thus to increase their effectiveness, preferably in cosmetic or dermatological preparations. It was also an object to find cosmetic or dermatological preparations in which hydrophilic skincare active ingredients can be stored in a stable
20 manner over a long period and which represent a good transport means for these active ingredients.

It was surprising and could not have been foreseen by the person skilled in the art that

25 cosmetic and dermatological formulations containing at least one hydrophilic active ingredient, characterized in that they comprise at least one dialkyl naphthalate which is characterized by the structural formula



in which R^1 and R^2 , independently of one another, are chosen from the group of branched and unbranched alkyl groups having 6 to 24 carbon atoms,
overcome the disadvantages of the prior art.

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As well as one or more oil phases, the preparations within the meaning of the present invention may preferably additionally comprise one or more water phases and be present, for example, in the form of W/O, O/W, W/O/W or O/W/O emulsions. Such formulations may preferably also be a microemulsion, a PIT emulsion, a solids 10 emulsions (i.e. an emulsion which is stabilized by solids, e.g. a Pickering emulsion), a sprayable emulsion or a hydrodispersion.

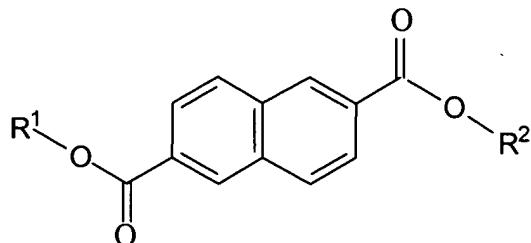
The preparations according to the invention are entirely satisfactory preparations in every respect which are not restricted to the limited choice of raw materials. 15 Accordingly, they are very particularly suitable for use as bases for preparation forms with diverse application purposes. The preparations according to the invention exhibit very good sensory and cosmetic properties, such as, for example, extensibility on the skin or the ability to absorb into the skin, and are further distinguished by very good active ingredient effectiveness coupled with excellent skincare data.

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It could not have been foreseen by the person skilled in the art that the use of alkyl naphthalates would better stabilize hydrophilic active ingredients against decomposition. In addition, the use according to the invention can surprisingly considerably increase the stability of hydrophilic active ingredients in water-containing 25 cosmetic or dermatological formulations compared with the prior art.

Detailed Description of the Preferred Embodiments

The invention therefore also provides for the use of at least one dialkyl naphthalate which is characterized by the structural formula



in which R¹ and R², independently of one another, are chosen from the group of branched and unbranched alkyl groups having 6 to 24 carbon atoms, for improving the effectiveness and increasing the stability of hydrophilic active ingredients in cosmetic or dermatological preparations.

Advantageous hydrophilic active ingredients which (individually or in any combinations with one another) are stabilized by the use according to the invention in an excellent manner are those listed below:

- biotin
- 15 • carnitine and derivatives
- creatine and derivatives
- folic acid
- pyridoxine
- niacinamide
- 20 • polyphenols (in particular flavonoids, very particularly alpha-glucosylrutin)
- ascorbic acid and derivatives
- Hamamelis
- Aloe Vera
- panthenol
- 25 • amino acids.

Particularly advantageous hydrophilic active ingredients for the purposes of the present invention are also water-soluble antioxidants, such as, for example, vitamins.

5 The amount of hydrophilic active ingredients (one or more compounds) in the preparations is preferably 0.0001 to 10% by weight, particularly preferably 0.001 to 5% by weight, based on the total weight of the preparation.

10 For the purposes of the present invention, dialkyl naphthalates in which R¹ and/or R² represent branched alkyl groups having 6 to 10 carbon atoms are advantageous. For the purposes of the present invention, very particular preference is given to diethylhexyl naphthalate, which is available, for example, under the trade name Hallbrite TQ™ from CP Hall or Corapan TQ™ from H&R.

15 According to the invention, cosmetic or dermatological preparations advantageously comprise 0.001 to 30% by weight, preferably 0.01 to 20% by weight, very particularly preferably 1 to 15% by weight, of one or more dialkyl naphthalates.

20 The cosmetic or dermatological photoprotection formulations according to the invention can have the customary composition and be used for cosmetic or dermatological photoprotection, in addition for the treatment, care and cleansing of the skin and/or of the hair and as a make-up product in decorative cosmetics.

25 Depending on their formulation, cosmetic or topical dermatological compositions for the purposes of the present invention may be used, for example, as skin protection cream, cleansing milk, day or night cream etc. It is in some cases possible and advantageous to use the compositions according to the invention as a basis for pharmaceutical formulations.

For use, the cosmetic and dermatological preparations are applied to the skin and/or the hair in a sufficient amount in the manner customary for cosmetics.

The cosmetic and dermatological preparations according to the invention can
5 comprise cosmetic auxiliaries as are customarily used in such preparations, e.g. preservatives, preservation helpers, bactericides, perfumes, substances to prevent foaming, dyes, pigments which have a coloring action, thickeners, moisturizing and/or humectant substances, fillers which improve the feel of the skin, fats, oils, waxes or other customary constituents of a cosmetic or dermatological formulation, such as
10 alcohols, polyols, polymers, foam stabilizers, electrolytes, organic solvents or silicone derivatives.

Advantageous preservatives for the purposes of the present invention are, for example, formaldehyde donors (such as e.g. DMDM hydantoin, which is available, for
15 example, under the trade name Glydant™ from Lonza), iodopropyl butylcarbamates (e.g. those available under the trade names Glycacil-L, Glycacil-S from Lonza, and/or Dekaben LMB from Jan Dekker), parabens (i.e. p-hydroxybenzoic alkyl esters, such as methyl, ethyl-, propyl- and/or butylparaben), phenoxyethanol, ethanol, benzoic acid and the like. According to the invention, the preservative system usually also
20 advantageously includes preservation helpers, such as, for example, octoxyglycerol, glycine soya etc. as well.

Particularly advantageous preparations are also obtained when antioxidants are used as additives or active ingredients. According to the invention, the preparations
25 advantageously comprise one or more antioxidants. Favorable, but nevertheless optional antioxidants which may be used are all antioxidants customary or suitable for cosmetic and/or dermatological applications.

The amount of antioxidants (one or more compounds) in the preparations is preferably 0.001 to 30% by weight, particularly preferably 0.05 to 20% by weight, in particular 0.1 to 10% by weight, based on the total weight of the preparation.

5 If vitamin E and/or derivatives thereof are the antioxidant or antioxidants, it is advantageous to choose their respective concentrations from the range from 0.001 to 10% by weight, based on the total weight of the formulation.

10 If vitamin A or vitamin A derivatives, or carotenes or derivatives thereof are the antioxidant or antioxidants, it is advantageous to choose their respective concentrations from the range from 0.001 to 10% by weight, based on the total weight of the formulation.

15 It is particularly advantageous when the cosmetic preparations according to the present invention comprise further cosmetic or dermatological active ingredients, preferred active ingredients being antioxidants which can protect the skin against oxidative stress.

20 Advantageous further active ingredients are natural active ingredients and/or derivatives thereof, such as e.g. ubiquinones, retinoids, carotenoids, creatine, taurine and/or β -alanine.

25 Formulations according to the invention, which comprise e.g. known antiwrinkle active ingredients, such as flavone glycosides (in particular α -glycosylrutin), coenzyme Q10, vitamin E and/or derivatives and the like, are particularly advantageously suitable for the prophylaxis and treatment of cosmetic or dermatological changes in skin, as arise, for example, during skin aging (such as, for example, dryness, roughness and formation of dryness wrinkles, itching, reduced refatting (e.g. after washing), visible vascular dilations (teleangiectases, couperosis), flaccidity and formation of wrinkles and

lines, local hyperpigmentation, hypopigmentation and abnormal pigmentation (e.g. age spots), increased susceptibility to mechanical stress (e.g. cracking) and the like). In addition, they are advantageously suitable against the appearance of dry or rough skin.

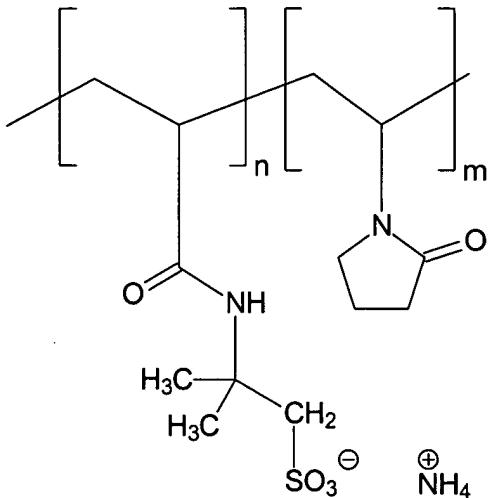
5 The water phase of the preparations according to the invention can advantageously comprise customary cosmetic auxiliaries, such as, for example, alcohols, in particular those of low carbon number, preferably ethanol and/or isopropanol, diols or polyols of low carbon number, and ethers thereof, preferably propylene glycol, glycerol, ethylene glycol, ethylene glycol monoethyl or monobutyl ether, propylene glycol monomethyl, monoethyl or monobutyl ether, diethylene glycol monomethyl or monoethyl ether and analogous products, polymers, foam stabilizers, electrolytes, and in particular one or more thickeners which may advantageously be chosen from the group consisting of silicon dioxide, aluminum silicates, polysaccharides or derivatives thereof, e.g. hyaluronic acid, xanthan gum, hydroxypropylmethylcellulose, 10 particularly advantageously from the group of polyacrylates, preferably a polyacrylate from the group of so-called carbopol, for example Carbopol 980, 981, 1382, 2984, 15 5984, in each case individually or in combination.

Also advantageous are copolymers of C₁₀₋₃₀-alkyl acrylates and one or more 20 monomers of acrylic acid, of methacrylic acid or esters thereof which are crosslinked with an allyl ether of sucrose or an allyl ether of pentaerythritol.

Compounds which bear the INCI name "Acrylates/C₁₀₋₃₀ Alkyl Acrylate 25 Crosspolymer" are advantageous. Those available under the trade names Pemulen TR1 and Pemulen TR2 from B. F. Goodrich Company are particularly advantageous.

Compounds which bear the INCI name Ammonium Acryloyldimethyltaurate-Vinylpyrrolidone copolymers are advantageous.

According to the invention, the Ammonium Acryloyldimethyltaurate/Vinylpyrrolidone copolymers advantageously have the empirical formula $[C_7H_{16}N_2SO_4]_n [C_6H_9NO]_m$, corresponding to a statistical structure as follows



5 Preferred species for the purposes of the present invention are listed in Chemical Abstracts under the Registry numbers 58374-69-9, 13162-05-5 and 88-12-0 and are available under the trade name Aristoflex® AVC from Clariant GmbH.

10 Also advantageous are copolymers/crosspolymers comprising Acryloyldimethyl Taurate, such as, for example, Simugel ® EG or Simugel ® EG from Seppic S.A.

Moisturizers can also preferably be used.

15 Moisturizers is the term used for substances or mixtures of substances which, following application or distribution on the surface of the skin, confer on cosmetic or dermatological preparations the property of reducing the moisture loss by the horny layer (also called transepidermal water loss (TEWL)) and/or have a positive influence on the hydration of the horny layer.

20 Advantageous moisturizers for the purposes of the present invention are, for example, glycerol, lactic acid and/or lactates, in particular sodium lactate, butylene

glycol, propylene glycol, biosaccharide gum-1, glycine soya, ethylhexyloxyglycerol, pyrrolidonecarboxylic acid and urea. In addition, it is particularly advantageous to use polymeric moisturizers from the group of water-soluble and/or water-swellable and/or water-gellable polysaccharides. Particularly advantageous are, for example, hyaluronic acid, chitosan and/or a fucose rich polysaccharide which is listed in Chemical Abstracts under the Registry number 178463-23-5 and is available, for example, under the name Fucogel®1000 from SOLABIA S.A.

The cosmetic or dermatological preparations according to the invention can also advantageously, but not necessarily, comprise fillers which, for example, further improve the sensory and cosmetic properties of the formulations and, for example, bring about or intensify a velvety or silky feel on the skin. Advantageous fillers for the purposes of the present invention are starch and starch derivatives (such as tapioca starch, distarch phosphate, aluminum or sodium starch octenylsuccinate and the like), pigments which primarily have neither a UV filter effect nor a coloring effect (such as e.g. boron nitride etc.) and/or Aerosils® (CAS No. 7631-86-9).

The oil phase of the formulations according to the invention is advantageously chosen from the group of polar oils, for example from the group of lecithins and of fatty acid triglycerides, namely the triglycerol esters of saturated and/or unsaturated, branched and/or unbranched alkanecarboxylic acids with a chain length of from 8 to 24, in particular 12 to 18, carbon atoms. The fatty acid triglycerides can, for example, advantageously be chosen from the group of synthetic, semisynthetic and natural oils, such as e.g. cocoglyceride, olive oil, sunflower oil, soybean oil, peanut oil, rapeseed oil, almond oil, palm oil, coconut oil, castor oil, wheatgerm oil, grapeseed oil, thistle oil, evening primrose oil, macadamia nut oil and the like.

Also advantageous according to the invention are e.g. natural waxes of animal and vegetable origin, such as, for example beeswax and other insect waxes, and berry wax, shea butter and/or lanolin (wool wax).

5 Further advantageous polar oil components for the purposes of the present invention may also be chosen from the group of esters of saturated and/or unsaturated, branched and/or unbranched alkanecarboxylic acids with a chain length of from 3 to 30 carbon atoms and saturated and/or unsaturated, branched and/or unbranched alcohols with a chain length of from 3 to 30 carbon atoms, and from the group of esters of
10 aromatic carboxylic acids and saturated and/or unsaturated, branched and/or unbranched alcohols with a chain length of from 3 to 30 carbon atoms. Such ester oils can then advantageously be chosen from the group consisting of octyl palmitate, octyl cocoate, octyl isostearate, octyldodecyl myristate, octyldodecanol, cetearyl isononanoate, isopropyl myristate, isopropyl palmitate, isopropyl stearate, isopropyl
15 oleate, n-butyl stearate, n-hexyl laurate, n-decyl oleate, isoctyl stearate, isononyl stearate, isononyl isononanoate, 2-ethylhexyl palmitate, 2-ethylhexyl laurate, 2-hexyldecyl stearate, 2-octyldodecyl palmitate, stearyl heptanoate, oleyl oleate, oleyl erucate, erucyl oleate, erucyl erucate, tridecyl stearate, tridecyl trimellitate, and synthetic, semisynthetic and natural mixtures of such esters, such as e.g. jojoba oil.

20 The oil phase can also advantageously be chosen from the group of dialkyl ethers and dialkyl carbonates, advantageous examples being dicaprylyl ether (*Cetiol OE*) and/or dicaprylyl carbonate, for example that available under the trade name *Cetiol CC* from Cognis.

25 It is also preferred the oil component(s) from the group consisting of isoeicosane, neopentyl glycol diheptanoate, propylene glycol dicaprylate/dicaprate, caprylic/capric/diglyceryl succinate, butylene glycol dicaprylate/dicaprate, C₁₂₋₁₃-alkyl lactate, di-C₁₂₋₁₃-alkyl tartrate, triisostearin, dipentaerythrityl hexacaprylate/hexacaprate,

propylene glycol monoisostearate, tricaprylin, dimethylisosorbide. It is particularly advantageous if the oil phase of the formulations according to the invention has a content of C₁₂₋₁₅-alkyl benzoate or consists entirely of this.

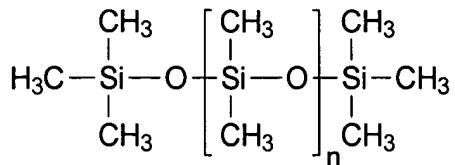
5 Advantageous oil components are also e.g. butyloctyl salicylate (for example that available under the trade name *Hallbrite BHB* from CP Hall), hexadecyl benzoate and butyloctyl benzoate and mixtures thereof (*Hallstar AB*).

10 Any desired mixtures of such oil and wax components can be used advantageously for the purposes of the present invention.

In addition, the oil phase can likewise advantageously also comprise nonpolar oils, for example those chosen from the group of branched and unbranched hydrocarbons and hydrocarbon waxes, in particular mineral oil, vaseline (petrolatum),
15 paraffin oil, squalane and squalene, polyolefins, hydrogenated polyisobutenes and isohexadecane. Among the polyolefins, polydecenes are the preferred substances.

The oil phase can also advantageously have a content of cyclic or linear silicone oils or consist entirely of such oils, although it is preferred to use an additional content of
20 other oil phase components apart from the silicone oil or the silicone oils.

Silicone oils are high molecular weight synthetic polymeric compounds in which silicon atoms are linked in a chain-like and/or network-like manner via oxygen atoms, and the remaining valences of the silicon are saturated by hydrocarbon radicals (in most
25 cases methyl, less often ethyl, propyl, phenyl groups etc.). Systematically, the silicone oils are referred to as polyorganosiloxanes. The methyl-substituted polyorganosiloxanes, which represent the most significant compounds of this group in terms of number and are characterized by the following structural formula



are also referred to as polydimethylsiloxane or Dimethicone (INCI). There are dimethicones with various chain lengths and with various molecular weights.

- 5 For the purposes of the present invention, particularly advantageous polyorganosiloxanes are, for example, dimethylpolysiloxanes [poly(dimethylsiloxane)], which are available, for example, under the trade names Abil 10 to 10 000 from Th. Goldschmidt. Also advantageous are phenylmethylpolysiloxanes (INCI: Phenyl Dimethicone, Phenyl Trimethicone), cyclic silicones (octamethylcyclotetrasiloxane or
- 10 Decamethylcyclopentasiloxane), which are also referred to as Cyclomethicones in accordance with INCI, amino-modified silicones (INCI: Amodimethicone) and silicone waxes, e.g. polysiloxane-polyalkylene copolymers (INCI: Stearyl Dimethicone and Cetyl Dimethicone) and dialkoxydimethylpolysiloxanes (Stearoxy Dimethicone and Behenoxy Stearyl Dimethicone), which are available as various Abil wax grades from Th.
- 15 Goldschmidt. However, for the purposes of the present invention, other silicone oils can also advantageously be used, for example cetyltrimethicone, hexamethylcyclotrisiloxane, polydimethylsiloxane, poly(methylphenylsiloxane).

- 20 For the purposes of the present invention, it is also advantageous to create cosmetic and dermatological preparations whose main purpose is not protection against sunlight, but which nevertheless contain a content of further UV protection substances. Thus, for example, UV-A and/or UV-B filter substances are usually incorporated into day creams or make-up products. UV protection substances, like antioxidants and, if desired, preservatives, represent effective protection of the preparations themselves
- 25 against decay. Also favorable are cosmetic and dermatological preparations which are in the form of a sunscreen composition.

Accordingly, the preparations within the meaning of the present invention preferably comprise at least one further UV-A, UV-B and/or broadband filter substance. The formulations may, but do not necessarily, optionally also comprise one or more organic and/or inorganic pigments as UV filter substances, which may be present in the
5 water phase and/or the oil phase.

In addition, the preparations according to the invention can advantageously also be in the form of so-called oil-free cosmetic or dermatological emulsions, which comprise a water phase and at least one UV filter substance which is liquid at room
10 temperature and/or one or more silicone derivatives as the further phase. Oil-free formulations for the purpose of the present invention may advantageously also comprise further lipophilic components – such as, for example, lipophilic active ingredients.

15 Particularly advantageous UV filter substances which are liquid at room temperature for the purposes of the present invention are homomenthyl salicylate (INCI: Homosalate), 2-ethylhexyl 2-cyano-3,3-diphenylacrylate (INCI: Octocrylene), 2-ethylhexyl 2-hydroxybenzoate (2-ethylhexyl salicylate, octyl salicylate, INCI: Octyl Salicylate) and esters of cinnamic acid, preferably 4-methoxycinnamic 2-ethylhexyl
20 ester (2-ethylhexyl 4-methoxycinnamate, INCI: Octyl Methoxycinnamate) and 4-methoxycinnamic isopentyl ester (isopentyl 4-methoxycinnamate, INCI: Isoamyl p-Methoxycinnamate).

Preferred inorganic pigments are metal oxides and/or other metal compounds
25 which are sparingly soluble or insoluble in water, in particular oxides of titanium (TiO_2), zinc (ZnO), iron (e.g. Fe_2O_3), zirconium (ZrO_2), silicon (SiO_2), manganese (e.g. MnO), aluminum (Al_2O_3), cerium (e.g. Ce_2O_3), mixed oxides of the corresponding metals, and mixtures of such oxides, and the sulfate of barium ($BaSO_4$).

The pigments can advantageously be used for the purposes of the present invention also in the form of commercially available oily or aqueous predispersions. Dispersion auxiliaries and/or solubility promoters may advantageously be added to these predispersions.

5 The pigments may, according to the invention, advantageously be surface-treated ("coated"), the intention being, for example, to form or retain a hydrophilic, amphiphilic or hydrophobic character. This surface treatment can consist in providing the pigments with a thin hydrophilic and/or hydrophobic inorganic and/or organic layer
10 by methods known per se. The various surface coatings for the purposes of the present invention may also comprise water.

Inorganic surface coatings for the purposes of the present invention may consist of aluminum oxide (Al_2O_3), aluminum hydroxide $\text{Al}(\text{OH})_3$, or aluminum oxide hydrate
15 (also: alumina, CAS No.: 1333-84-2), sodium hexametaphosphate $(\text{NaPO}_3)_6$, sodium metaphosphate $(\text{NaPO}_3)_n$, silicon dioxide (SiO_2) (also: silica, CAS No.: 7631-86-9), or iron oxide (Fe_2O_3). These inorganic surface coatings may exist on their own, in combination and/or in combination with organic coating materials.

20 Organic surface coatings for the purposes of the present invention may consist of vegetable or animal aluminum stearate, vegetable or animal stearic acid, lauric acid, dimethylpolysiloxane, (also: dimethicone), methylpolysiloxane (methicone), simethicone (a mixture of dimethylpolysiloxane with an average chain length of from 200 to 25 350 dimethylsiloxane units and silica gel) or alginic acid. These organic surface coatings may exist on their own, in combination and/or in combination with inorganic coating materials.

Zinc oxide particles and predispersions of zinc oxide particles which are suitable according to the invention are available under the following trade names from the companies listed:

Trade name	Coating	Manufacturer
Z- Cote HP1	2% dimethicone	BASF
Z- Cote	/	BASF
ZnO NDM	5% dimethicone	H&R
ZnO Neutral	/	H&R
ZnO MZ 303 M	3% methicone	Tayca Corp.

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Suitable titanium dioxide particles and predispersions of titanium dioxide particles are available under the following trade names from the companies listed:

Trade name	Coating	Manufacturer
MT-100TV	aluminum hydroxide/stearic acid	Tayca Corporation
MT-100Z	aluminum hydroxide/stearic acid	Tayca Corporation
Eusolex T-2000	alumina/simethicone	Merck KgaA
Titanium dioxide T805 (Uvinul TiO ₂)	octyltrimethylsilane	Degussa
Tioveil AQ 10PG	alumina/silica	Solaveil / Uniquema

10 Further advantageous pigments are latex particles. Latex particles which are advantageous according to the invention are those described in the following specifications: US 5,663,213 and EP 0 761 201. Particularly advantageous latex

particles are those which are formed from water and styrene/acrylate copolymers and are available, for example, under the trade name "Alliance SunSphere" from Rohm & Haas.

5 Advantageous UV-A filter substances for the purposes of the present invention are dibenzoylmethane derivatives, in particular 4-(tert-butyl)-4'-methoxydibenzoylmethane (CAS No. 70356-09-1), which is sold by Givaudan under the name Parsol® 1789 and by Merck under the trade name Eusolex® 9020.

10 Advantageous further UV filter substances for the purposes of the present invention are sulfonated, water-soluble UV filters, such as, for example,

- phenylene-1,4-bis(2-benzimidazyl)-3,3'-5,5'-tetrasulfonic acid and its salts, particularly the corresponding sodium, potassium or triethanolammonium salts, in particular the phenylene-1,4-bis(2-benzimidazyl)-3,3'-5,5'-tetrasulfonic bis-sodium salt with the INCI name Bisimidazylate (CAS No.: 180898-37-7), which is available, for example, under the trade name Neo Heliopan AP from Haarmann & Reimer;
- salts of 2-phenylbenzimidazole-5-sulfonic acid, such as its sodium, potassium or its triethanolammonium salt, and the sulfonic acid itself with the INCI name Phenylbenzimidazole Sulfonic Acid (CAS No. 27503-81-7), which is available, for example, under the trade name Eusolex 232 from Merck or under Neo Heliopan Hydro from Haarmann & Reimer;
- 1,4-di(2-oxo-10-sulfo-3-bornylidenemethyl)benzene (also: 3,3'-(1,4-phenylene-dimethylene)bis(7,7-dimethyl-2-oxobicyclo[2.2.1]hept-1-ylmethane sulfonic acid) and salts thereof (particularly the corresponding 10-sulfato compounds, in particular the corresponding sodium, potassium or triethanolammonium salt), which is also referred to as benzene-1,4-di(2-oxo-3-bornylidenemethyl-10-sulfonic acid). Benzene-1,4-di(2-oxo-3-bornylidenemethyl-10-sulfonic acid) has the INCI name

Terephthalidene Dicamphor Sulfonic Acid (CAS No.: 90457-82-2) and is available, for example, under the trade name Mexoryl SX from Chimex;

- sulfonic acid derivatives of 3-benzylidenecamphor, such as e.g. 4-(2-oxo-3-bornylidenemethyl)benzenesulfonic acid, 2-methyl-5-(2-oxo-3-bornylidene-methyl)sulfonic acid and salts thereof.

Advantageous UV filter substances for the purposes of the present invention are also so-called broadband filters, i.e. filter substances which absorb both UV-A- and also UV-B-radiation.

Advantageous broadband filters or UV-B filter substances are, for example, triazine derivatives, such as e.g.

- 2,4-bis{[4-(2-ethylhexyloxy)-2-hydroxy]phenyl}-6-(4-methoxyphenyl)-1,3,5-triazine (INCI: Methylene Bis-Benzotriazolmethylbutylphenol), which is available under the trade name Tinosorb® S from CIBA-Chemikalien GmbH;
- dioctylbutylamidotriazole (INCI: Diethylhexylbutamidotriazole), which is available under the trade name UVASORB HEB from Sigma 3V;
- tris(2-ethylhexyl) 4,4',4''-(1,3,5-triazine-2,4,6-triyltriamino)trisbenzoate), also: 2,4,6-tris[anilino(p-carbo-2'-ethyl-1'-hexyloxy)]-1,3,5-triazine (INCI: Octyl Triazole), which is sold by BASF Aktiengesellschaft under the trade name UVINUL® T 150.

An advantageous broadband filter for the purposes of the present invention is also 2,2'-methylenebis(6-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)phenol) (INCI: Bisoctyltriazole), which is available under the trade name Tinosorb® M from CIBA-Chemikalien GmbH.

An advantageous broadband filter for the purposes of the present invention is also 2-(2H-benzotriazol-2-yl)-4-methyl-6-[2-methyl-3-[1,3,3,3-tetramethyl-1-

[(trimethylsilyl)oxy]disiloxanyl]propyl]phenol (CAS No.: 155633-54-8) with the INCI name Drometrizole Trisiloxane.

The further UV filter substances may be oil-soluble. Advantageous oil-soluble
5 filter substances are e.g.:

- 3-benzylidenecamphor derivatives, preferably 3-(4-methylbenzylidene)camphor, 3-benzylidenecamphor;
- 4-aminobenzoic acid derivatives, preferably 2-ethylhexyl 4-(dimethylamino)benzoate, amyl 4-(dimethylamino)benzoate;
- 10 ▪ derivatives of benzophenone, preferably 2-hydroxy-4-methoxybenzophenone, 2-hydroxy-4-methoxy-4'-methylbenzophenone, 2,2'-dihydroxy-4-methoxybenzo-phenone
- and UV filters bound to polymers.

15 A further photoprotective filter substance to be used advantageously according to the invention is ethylhexyl 2-cyano-3,3-diphenylacrylate (Octocrylene), which is available from BASF under the name Uvinul® N 539.

Particularly advantageous preparations for the purposes of the present invention,
20 which may be characterized by a high or very high UV-A protection, comprise, as well as the filter substance(s) according to the invention, preferably also further UV-A and/or broadband filters, in particular dibenzoylmethane derivatives [for example 4-(tert-butyl)-4'-methoxydibenzoylmethane] and/or 2,4-bis{[4-(2-ethylhexyloxy)-2-hydroxy]phenyl}-6-(4-methoxyphenyl)-1,3,5-triazine, in each case individually or in any combinations with
25 one another.

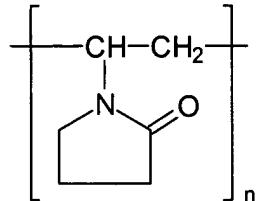
The list of UV filters specified which can be used for the purposes of the present invention is not of course intended to be limiting.

Advantageously, the preparations according to the invention comprise the substances which absorb UV radiation in the UV-A and/or UV-B region in a total amount of e.g. 0.1% by weight to 30% by weight, preferably 0.5 to 20% by weight, in particular 1.0 to 15.0% by weight, in each case based on the total weight of the preparations, in 5 order to provide cosmetic preparations which protect the hair and/or the skin from the entire range of ultraviolet radiation.

In addition, it may in some instances be advantageous to incorporate film formers into the cosmetic or dermatological preparations according to the invention, for example 10 in order to improve the water resistance of the preparations or to increase the UV protection performance (UV-A and/or UV-B boosting). Water-soluble or dispersible and also fat-soluble film formers are suitable, in each case individually or in combination with one another.

15 Advantageous water-soluble or dispersible film formers are e.g. polyurethanes (e.g. the Avalure® grades from Goodrich), dimethicone copolyol polyacrylate (Silsoft Surface® from Witco Organo Silicones Group), PVP/VA (VA = vinyl acetate) copolymer (Luviscol VA 64 Powder from BASF) etc.

20 Advantageous fat-soluble film formers are e.g. the film formers from the group of polymers based on polyvinylpyrrolidone (PVP)



Particular preference is given to copolymers of polyvinylpyrrolidone, for example 25 the PVP hexadecene copolymer and the PVP eicosene copolymer, which are available under the trade names Antaron V216 and Antaron V220 from GAF Chemicals Cooperation and also tricontanyl PVP and the like.

The examples below serve to illustrate the present invention without limiting it. The numerical values in the examples are percentages by weight, based on the total weight of the particular preparations.

EXAMPLES

1. O/W sunscreen emulsions

	1	2	3	4	5	6	7
Glycerol monostearate SE	0.50	1.00	3.00			1.50	
Glyceryl stearate citrate	2.00			1.00	2.00		2.50
Stearic acid		3.00		2.00			
PEG-40 stearate	0.50					2.00	
Cetyl dimethicone copolyol				0.75		0.50	
Cetyl phosphate					1.00		
Stearyl alcohol			3.00			2.00	0.50
Cetyl Alcohol	2.50	1.00		1.50	0.50		2.00
Ethylhexyl methoxycinnamate					6.00		8.00
Anisotriazine		1.50	2.50		2.50		2.50
Butylmethoxydibenzoylmetha ne	1.00	3.00			2.80		1.50
Bisimidazylate		0.50				1.70	
Ethylhexyltriazone	4.00		3.00		4.00	2.00	
Octocrylene		4.00					2.50
Diethylhexylbutamidotriazole	1.00				1.00		
Phenylbenzimidazolesulfonic acid	0.50						
Biocetyltriazole	2.00		0.50		2.50		
Homosalate		2.00					
Ethylhexyl salicylate			3.00				5.00
Drometrizole trisiloxane			0.5			1.00	
Terephthalidenedicamphor-		1.50			1.00	0.50	

sulfonic acid							
Diethylhexyl 2,6-naphthalate	3.50	4.80	7.00	9.50	6.70	5.50	8.00
Titanium dioxide MT-100Z	1.00				3.00	2.00	
Zinc oxide NDM			1.50			2.00	3.00
C12-15 alkyl benzoate		2.50			4.00	7.00	5.00
Dicaprylyl ether			3.50		2.00		
Butylene glycol dicaprylate/dicaprate	5.00			6.00			
Dibutyl adipate			6.00			2.00	2.00
Dimethicone		0.50	1.00		2.00		
Cyclomethicone	2.00			0.50			0.50
Shea butter		2.00					0.50
PVP hexadecene copolymer	0.50			0.50	1.00		1.00
Tricontanyl PVP		0.50	1.00				1.00
Glycerol	3.00	7.50		7.50	5.00		2.50
Xanthan gum	0.15		0.05				0.30
Sodium carbomer		0.20	0.10	0.20			
Vitamin E acetate	0.50		0.25	0.50	0.75		1.00
Alpha-glucosylrutin	0.25	0.75		0.20			
Ascorbic acid					2.50		
Panthenol			1.50			5.00	
Aloe Vera			1.50				3.50
DMDM hydantoin		0.60	0.40	0.20			
Konkaben LMB ®				0.18	0.20	0.10	0.15
Methylparaben	0.15		0.25		0.50		
Phenoxyethanol	1.00	0.40		0.40	0.50	0.40	0.60
EDTA		0.20	0.35	0.50	0.02		0.03
Iminodisuccinic acid	0.35	0.10			0.10		

Ethanol		2.00	1.50		3.00		1.00
Perfume	0.20	0.20				0.20	0.20
Water	ad 100						

2. Hydrodispersions

	1	2	3	4	5
PEG-40 stearate	1.00			0.5	
Cetyl alcohol			1.00		
Sodium carbomer		0.20		0.30	
Acrylates/C10-30 alkyl acrylate crosspolymer	0.50		0.40	0.10	0.10
Xanthan gum		0.30	0.15		0.50
Ethylhexyl methoxycinnamate				5.00	8.00
Anisotriazine				2.00	2.50
Butylmethoxydibenzoylmethane		0.50	2.00	3.00	2.50
Bisimidazylate			1.50		3.00
Ethylhexyltriazone			3.00	4.00	
Octocrylene		4.00	3.90		2.50
Diethylhexylbutamidotriazole				2.00	
Phenylbenzimidazolesulfonic acid				3.00	
Drometrizole trisiloxane			1.00		1.50
Terephthalidenedicamphorsulfonic acid		0.50			1.00
Diethylhexyl 2,6-naphthalate	4.50	8.00	7.20	5.50	9.80
Titanium dioxide MT-100TV			2.00		1.00
Zinc oxide HP1					3.00

C12-15 alkyl benzoate	2.00	2.50			
Butylene glycol dicaprylate/dicaprate	4.00		2.00	6.00	
Dicaprylyl carbonate		2.00	6.00		
Dimethicone		0.50	1.00		
Shea butter		2.00		3.50	1.50
PVP hexadecene copolymer	0.50			0.50	1.00
Ethylhexylglycerol			1.00		0.50
Glycerol	3.00	7.50		7.50	2.50
Glycine soya			1.50		
Vitamin E	0.50		0.25		1.00
Alpha-glucosylrutin	1.00	0.25	0.75		
Ascorbyl palmitate	0.25			0.65	0.40
DMDM hydantoin		0.60	0.40	0.20	
Konkaben LMB ®	0.20				0.15
Methylparaben	0.50		0.25	0.15	
Phenoxyethanol	0.50	0.40		1.00	0.60
Iminodisuccinic acid	0.50		0.35	1.00	
Ethanol	3.00	2.00	1.50		1.00
Perfume	0.20		0.20		0.20
Water	ad 100	ad 100	ad 100	ad 100	ad 100

3. W/O sunscreen emulsions

	1	2	3	4	5
Cetyltrimethicone copolyol		2.50		4.00	
Polyglyceryl-2 dipolyhydroxystearate	5.00				7.00

PEG-30 dipolyhydroxystearate			5.00		
Laurylmethicone copolyol	3.00		2.00		
Ethylhexyl methoxycinnamate		8.00		5.00	4.00
Anisotriazine		2.50	2.00	2.00	2.50
Butylmethoxydibenzoylmethane		3.00		1.00	0.70
Bisimidazylate				2.00	2.60
Ethylhexyltriazone			3.00	4.00	
4-Methylbenzylidenecamphor		2.00		4.00	2.00
Octocrylene		2.50	3.90		2.50
Diethylhexylbutamidotriazole				2.00	
Phenylbenzimidazolesulfonic acid				3.00	2.00
Bisoctyltriazole			2.00	0.50	
Dimethicone diethylbenzalmalonate			1.50		0.50
Drometrizole trisiloxane		1.00			1.50
Terephthalidenedicamphorsulfonic acid			1.00		0.50
Diethylhexyl 2,6-naphthalate	7.50	5.50	8.50	4.00	12.00
Titanium dioxide T805		2.00	1.50		3.00
Z-Cote HP1				8.00	2.00
Mineral oil	5.00		10.0		8.00
C12-15 alkyl benzoate		5.00		9.00	
Dicaprylyl ether	10.00				7.00
Butylene glycol dicaprylate/dicaprate			2.00	8.00	4.00
Dicaprylyl carbonate	5.00		6.00		

Dimethicone		4.00	1.00	5.00	
Cyclomethicone	2.00	25.00			2.00
Shea butter	2.00		3.00		
PVP hexadecene copolymer	0.50			0.50	1.00
Ethylhexylglycerol		0.30	1.00		0.50
Glycerol	3.00	7.50		7.50	2.50
Glycine soya		1.00	1.50		
MgSO ₄	1.00	0.50		0.50	
Vitamin E acetate	0.50		0.25		1.00
Alpha-glucosylrutin	0.50			1.00	
Aloe Vera	0.15	0.50	4.00	1.50	
Biotin					3.00
DMDM hydantoin		0.60	0.40	0.20	
Methylparaben	0.50		0.25	0.15	
Phenoxyethanol	0.50	0.40		1.00	0.60
EDTA	0.20	0.35		0.15	
Ethanol	3.00		6.00		1.00
Perfume	0.20			0.20	0.20
Water	ad 100				

4. Solids-stabilized emulsions

	1	2	3	4	5
Mineral oil			16.0	16.0	
Octyldodecanol	9.0	9.0	5.0		
Caprylic/capric triglyceride	9.0	9.0	6.0		
C12-15 alkylbenzoate				5.0	8.0
Butylene glycol dicaprylate/ dicaprate		3.5			8.0

Dicaprylyl ether	9.0			4.0	
Dicaprylyl carbonate		9.0			
Hydroxyoctacosanyl hydroxystearate	2.0	2.0	2.0	2.0	1.5
Disteardimonium hectorite	1.0		0.5	0.5	0.25
Cera Microcristallina + Paraffinum Liquidum					5.0
Hydroxypropylmethylcellulose		0.15			0.05
Dimethicone			2.50		3.0
Butylmethoxydibenzoylmethane		0.50	3.50	1.50	0.50
Ethylhexyl methoxycinnamate					3.0
Diethylhexylbutamidotriazone		2.50			4.0
Bisoctyltriazole			1.00	2.0	
Drometrizole trisiloxane		0.50		1.00	
Terephthalidenedicamphor-sulfonic acid		1.00	0.50		1.50
Bisimidazylate		2.00	3.10	1.50	0.50
Eusolex® T-2000		2.0	4.0	2.0	4.0
Titanium dioxide T 805					3.0
Zinc oxide HP1				6.0	
Silica dimethyl silylate			1.0		
Boron nitride	2.0				
Starch/sodium metaphosphate polymer		0.5			
Diethylhexyl 2,6-naphthalate	5.00	7.00	8.50	3.00	4.50
Tapioca starch				1.0	
Biotin	0.20		1.50	0.50	

Alpha-glucosylrutin	1.50	2.00			3.00
Sodium chloride	1.0	1.0	1.0	1.0	1.0
Glycerol	5.0	10.0	3.0	6.0	10.0
Trisodium EDTA		1.0		1.0	
Methylparaben	0.21				0.2
Propylparaben	0.07				
Phenoxyethanol	0.5		0.4	0.4	0.5
Hexamidine diisethionate					0.08
Diazolidinylurea			0.28	0.28	
Alcohol				2.5	
Perfume	q.s.	q.s.	q.s.	q.s.	q.s.
Water	ad 100				

5. PIT emulsions

	1	2	3	4	5	6	7	8
Glycerol monostearate SE	5.50	2.00	3.00	5.00			0.50	4.00
Glyceryl isostearate					3.50	4.00	2.00	
Isoceteth-20		0.50			2.00			
Ceteareth-12	1.00	5.00		1.00				3.50
Ceteareth-20	4.50			2.00		2.50	3.00	
PEG-100 stearate			1.00		1.00			0.50
Cetyl alcohol	2.50	1.00		1.50		0.50	1.50	
Cetyl palmitate				0.50		1.00		
Cetyl dimethicone copolyol	0.50				0.50		1.00	
Polyglyceryl-2 dipolyhydroxystearate				0.75	0.25			
Diethylhexyl 2,6-naphthalate	7.0	3.5	1.0	6.0	0.5	4.0	5.0	4.5
Anisotriazine			0.50	2.00		3.00		

Butylmethoxydibenzoylmethane			1.00		5.00			
Bisimidazylate		2.00			1.00			
Terephthalidenedicamphorsulfonic acid			0.50				1.00	
Drometrizole trisiloxane			2.00			3.00		1.00
Ethylhexyl methoxycinnamate				4.50	5.00	8.00		
Ethylhexyl salicylate					3.50	4.00		
Diocetylbutamidotriazole				3.00	2.00	2.00		1.50
Ethylhexyltriazone			2.00	4.00			1.50	3.00
Dimethicone diethylbenzalmalonate		4.50			3.50			
Octocrylene			5.00		8.00			7.50
Phenylbenzimidazolesulfonic acid		5.00		3.00	1.00			
C12-15 alkyl benzoate	3.50				6.50	4.00		
Cocoglycerides		3.00		3.00		2.50		3.50
Dicaprylyl ether	4.00							
Butylene glycol dicaprylate/dicaprate		4.00		3.00				
Dicaprylyl carbonate				0.50				6.00
Dibutyl adipate			2.50			3.00		1.00
Cyclomethicone		3.00						4.00
PVP hexadecene copolymer				1.00	1.50			
Glycerol	10.0	5.00		7.50				
Tocopherol	1.00			0.75	0.50		1.00	0.25
Alpha-glucosylrutin	0.45		0.50		1.00	0.25		0.15
Hammamelis extract		5.00		10.0 0		4.50		

Aloe Vera							5.00	2.50
Shea butter		2.00						0.50
Iodopropyl butylcarbamate	0.12				0.20	0.15		
DMDM hydantoin				0.10				
Methylparaben		0.50	0.25		0.45			
Phenoxyethanol	0.50	0.40		1.00				1.00
Octoxyglycerol		0.30			1.00			
Ethanol				2.00			7.50	4.00
Trisodium EDTA		0.40		0.15		0.20		0.50
Perfume	0.20		0.20	0.20	0.45			0.20
Water	ad 100							